Cost and Management

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As the author of the monthly feature, "C. & M. Round-Up", Mr. Barfoot has become well known to the readers of "Cost and Management". As Cost and Budget Supervisor for the three manufacturing divisions of Fiberglas Canada Limited he is well qualified to write on the topic of budgets and budgetary control. A Registered Member of S.I.C.A. of Ontario, Mr. Barfoot became Plant Accountant and Office Manager of Fiberglas' Sarnia plant in 1948 and was appointed to his present position in 1952.

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Editorial Comment . . .

British Institute Offers Post Graduate Degree

On December 18, 1952 the Institute of Cost and Works Accountants (Great Britain) announced the requirements of qualification that would permit the successful candidate to use the degree F.C.W.A. The purpose of the "Fellowship in Management Accountancy" as stated in the booklet issued by the Institute: "There are a number of excellent accountancy qualifications that exist to-day, each with its own particular emphasis and giving a thorough grounding in various aspects of the art of accountancy, but none requires a course of studies and a minimum of practical experience that will fully equip a man for the highest responsibilities now confronting the accountant in industry. The only way of filling this gap in the profession's qualifications without overloading an already heavy examination syllabus is by making a postgraduate award."

The Fellowship is open to members of certain overseas bodies of accountants and to members of stated associations of the British Isles. The syllabus comprises six examinations: (1) Management-Factory and Distribution; (2) Statistical Method; (3) Management Accountancy; (4) Economic Aspects of Industry and Commerce; (5) Advanced Cost Accounting and (6) Company Law.

Exemptions in certain of these subjects are granted to members of recognized bodies according to the syllabus of their own qualifying examination. In order to sit the examination the candidate must be at least 25 years of age, a member of the Institute (or other body) and must have had three years practical experience. In order to receive the Fellowship the candidate must possess the certificate of the Fellowship examination, be at least 26 years of age, have had not less than five years practical experience and be engaged in a responsible position in management accounting or as a Consultant.

In offering the Fellowship the Institute is seeking to bring together in one final qualification the two present major accounting qualifications, that is: (1) accounting in the public interest and (2) accounting for management. It could be argued that perhaps the syllabus is not as complete as it could be — but it is interesting to note that the president of the Institute in making the announcement stated that he was "looking forward to the co-operation of other professional accountancy bodies in establishing a representative Board of Examiners so that the highest standards can be consistently applied on the financial as well as on the (management) sides of the examinations for this Fellowship."

One of the major problems to be faced by the Institute is the attracting of promising candidates for the degree — since by virtue of

the apparently stringent examinations encumbents of responsible management positions will not feel too strongly the need for further qualifications. It is therefore possible that the absence of this 'degree' among the 'bosses' could act as a deterrent to sudden enthusiasm. Such a consideration might be counter-balanced in two ways:

(1) (least controllable) is for men now holding responsible positions to enthusiastically encourage this course of study, or—

(2) (more controllable) is for all accounting "associations" to set up a general Board of Examiners as suggested by the Institute.

It is certainly not amiss to hope that those responsible for qualifying men in the profession will unite in their efforts so as to jointly provide these men with the best qualification possible.

The step taken by the British Institute might well be the subject of serious review by the Canadian profession.

Business Talent Market

Statisticians and politicians have been keeping us well informed on the economic growth of Canada and our increasing international prestige in all aspects of commerce. Assuming the accuracy of optimistic forecasts and continued healthy development during the foreseeable future, we are lead to believe that this wonderland should be an ideal resort for personal talents to bud, blossom and bear fruit. It is therefore somewhat disturbing to observe that we appear to have as much dissatisfaction in employee relations as was experienced when conditions and opportunities were much less attractive. It may also be noted that this unrest does not seem to be confined to any one group or classification but includes union membership, general office staff and various levels of management personnel.

Perhaps in some respects employee values have assumed a trading position similar to that of securities on the stock exchange, with the result that some are being sold short, others maintain a suitable price and yield, and a few make spectacular rises without justifiable merit. There is also occasional trading in the blue-chip brands but their price seldom depreciates to any marked extent. While values may be expected to change by virtue of low and medium grades developing into high grades and vice versa, probably the significant fact at the present time is the large volume of transactions and this is by no means confined to the 'penny' group.

With most people of the type under consideration, the effort expended in daily tasks is motivated by a desire to either *achieve* or *create* or both. Consequently, situations which do not afford adequate opportunity for full expression of these desires will quickly become unattractive. The next step is to seek the market-place in the hope of

finding an exchange that will satisfy these desires. Our high level of employment indicates that most of this stock is being absorbed and the growth in wage and salary levels would suggest improved valuations, but the underlying causes of discontent are not necessarily corrected by the trading policy. It is difficult to forecast what might happen under the stress of reactionary influences in the business scene, but it seems likely that those individuals who have not been held in any portfolio long enough to establish a definite earning power might under adverse conditions be treated as LIFO inventory.

There is some evidence to suggest that one of the most restless groups at the present time is the junior and intermediate management class with only moderately good incomes. These people are at the development point where they are assuming increased responsibility and social status, and find that high price coupled with taxation and insurance demands deplete retainable earnings to a negligible amount, hence the basic desire for achievement is frustrated. Similarly for those with creative instincts employed by management unreceptive to rapid change, it becomes natural to seek new areas of endeavour in an effort to find enjoyment of expression.

Solutions to these problems are not readily at hand. Business and educational institutions are jointly endeavouring to train junior leaders, in fact the universities across the country have, almost without exception, established special courses for this purpose. Some interesting highlights in this trend are outlined in an article in The Financial Post issue of April 11th, 1953. There is an old adage that "a little knowledge is dangerous" and it seems entirely possible that some graduates of this training are assuming a "here I am — you've been waiting for me" attitude upon entering the management ranks and, perhaps while qualified technically, are lacking in appreciation of other essentials such as team work, co-operation, tradition, timing and many other business factors.

A mellowing process is often slow and painful, creating a strain on human relationships. The raw material is excellent and if the control and direction is equally good, a finished product of real quality should emerge. In this process a few simple measures, which are easily applied, might tend toward a better understanding and performance. Among these could be listed:

(a) More efficient and careful selection.
(b) Self-analysis of objectives by individuals.
(c) Creation of a partnership rather than line of authority atmosphere.
(d) Substitution of encouragement for criticism.
(e) Patience.
(f) Recognition and reward where due.

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C & M Round-Up . . .

By N. R. Barfoot, R.I.A.

Labour Management Agreements

A recent survey of union contracts made by the department of labour shows some interesting facts. The analysis covered some 564 agreements involving 343,100 workers. Main characteristics are:

Closed Shop

Most contracts have no provision requiring union membership, or closed shop as a condition of employment.

Check Off

Eight of ten workers are affected by the check off system of union dues deduction from payroll. Three of the eight are compulsory, the majority operate under a voluntary system.

The five day week is the most common arrangement affecting about one half the workers.

Overtime is usually paid at the rate of time and one half. One out of five workers is treated otherwise, and the majority of these is at time and one quarter.

Leisure Time

Most contracts say something about leisure time. Almost all receive five or more statutory holidays, and 15% had all or some of these holidays paid for.

Seniority clauses are common to almost all contracts. As in all discussions on this subject the importance of accumulated seniority compared to skill and ability gives rise to much variation both in wording and interpretation.

Grievance Procedure

Practically all agreements include grievance procedures.

Wage provisions are another integral part of most agreements and a listing of rates is common.

Mines

For those interested in mines the past few months have been hectic to say the least. The big uranium and big base metals rush has come and is not yet gone. Some of the figures quoted make the famous gold rushes of the past look pretty small. A few of the finds are:

Nickel — a possible billion tons of nickel bearing ore at Mystery Lake, Manitoba. More deposits in the Yukon and North West Territories and Quebec.

Lead — Zinc deposits appear to show 30 million tons of ore of exceptional grades in New Brunswick.

Copper—70 million tons of 1 to 2% ore in Quebec's Gaspe Peninsula.

Uranium — The favourable area at Beaverlodge exceeds 100 sq. miles.

Tungsten — World's largest mine in B.C.

Chrome Ore — 8 million tons of ore estimated in Manitoba.

Actual mineral production in Canada for the past 5 years shows:

1948	820 million tons
1949	901 million tons
1950	1,045 million tons
1951	1,228 million tons
1952	1,278 million tons

New Plants

Within the next few weeks many of the new chemical plants planned over the last two years will come on stream, as they say in this field.

Some are entirely new, others, additions to present facilities, the list is much more than impressive, it is a parade of giants.

Carbon Black, Sarnia — $3 million plant. Annual production 35 - 50 million lbs. New.

Formaldehyde, Belleville — Annual capacity — 30 million lbs. In 1952 we imported 27 million lbs.

Acetene and Isopropyl alcohol — Plants at Montreal. Annual capacity 12 million lbs. alcohol, 8 million acetene.

Ethylene Glycol (antifreeze), Montreal — 20 million lbs. annual production.

Formaldehyde, Quebec — 30 million lbs. annual capacity.

Phosphorus, Quebec — Substantial additions to the production of this material in the early Fall. Used in synthetic detergents.

Polyethylene, Edmonton — $13 million plant. Annual capacity 12 million lbs. used in moulded houseware, and wire and cable coating.

Careers

Fourteen of the major occupational groups in Canada have prepared films describing and advising on the work requirements and employment opportunities of their professions.

Education and in particular minimum secondary school is stressed. They are available to schools and fit into a 40 minute class period.

They were prepared by Associated Screen News Ltd., Toronto and of interest to accountants is the film covering their field.

"Accounting" — presented by the Institute of Chartered Accountants; a brief review of the facts of an accountant's life is given, followed by a discussion of training procedures. The advantages of professional status is stressed.

A few of the other professional groups described are: Banking, Dentistry, Insurance, Journalism, Medicine, Mining, Pharmacy.

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Business Stealing— Means and Prevention . . .

By Roy C. Taylor,
General Auditor, The B. F. Goodrich Co., Akron, Ohio

THE following is a review and condensation of Mr. Taylor's recent article on Misappropriations with a view toward prevention. It is a timely and somewhat alarming commentary on the problem of business losses due to embezzlement.

It is a startling fact but nevertheless a true one that embezzlement in business can easily reach the billion mark this year. It is just as disconcerting to learn that these irregular activities are going on at an accelerated rate and are affecting many well respected men and women. The deterioration of the moral code in so many business people is extremely serious. A great concern will be felt also by all business men as to the adequacy of their internal controls, as a means of prevention.

Some of these peculations are no doubt the result of cleverly laid schemes. Others work on the principle of borrowing money to tide them over a difficult financial period. Some consider that a certain ethical relativity exists in the matter. However, the business manager or internal auditor must set up ways and means to destroy opportunity.

It is usually accepted to-day that human relations is one of the more important problems of business. We can afford therefore, to spend some time on the question of people and stealing. With emphasis on its prevention we can save potential defaulters from embarrassment, disgrace, and prison as well as business expense.

A list of seventeen principal danger signals related to stealing in business is given below.

Principal Danger Signals Related To Embezzlement

1. Borrowing small amounts from fellow employees.
2. Placing personal cheques in change funds — undated, postdated, and past dated — or requesting others to "hold cheques".
3. Personal cheques cashed and returned for irregular reasons.
4. Collectors or creditors appearing at the store or office, and excessive use of telephone to "stall off" creditors.
5. Placing unauthorized I.O.U.'s in change funds or prevailing on others in authority to accept I.O.U.'s for small short-term loans.
6. Inclination toward covering up inefficiencies or occasional "plugging" of figures.
7. Pronounced criticism of others, in endeavouring to divert suspicion.
8. Replying with stilted and unreasonable explanations on any investigations. Peculiar mannerisms.
9. Gambling in any form, beyond ability to stand loss.

10. Excessive drinking, night clubbing, associating with questionable characters.
11. Buying or otherwise acquiring through business channels expensive automobiles and extravagant household furnishings.
12. Explaining a higher standard of living as money left from an estate — often warranting a confidential investigation.
13. Getting sore on reasonable questioning. Unusually calm under severe questioning.
14. Refusing to leave custody of records during the day.
15. Refusing to take vacations for fear of detection. Shunning promotions.
16. Constant association with and entertainment by a member of a supplier's staff.
17. Carrying an unusually large bank balance and/or heavy buying of securities.

An analysis shows that the chief motives for stealing are:

1. Living beyond income, debts incurred before employment, and/or obligations incurred since employment.
2. Gambling, liquor and questionable associates.
3. Illness and hospital bills.

How often do you see evidence of financial embarrassment or high living in your own employees? How many times do you wonder how some moderately paid clerk is able to afford an expensive car at the same time as he brings up a family and buys a house? Business men can well afford to become concerned about these matters and acquainted with the 17 danger signals listed above. They may not represent direct evidence of peculation but often provide a motive for later "borrowings".

We should keep in mind that the small stolen amount usually pyramids in size as the misappropriations progress.

Very often the amount claimed on the bonding company is small in relation to that stolen. All those in charge of assets, physical or cash should be alert to any danger signal or motive indicating possible larceny.

The methods of business fraud will be of extreme interest to all business men. The 46 more common methods listed below will certainly raise the question: Will my internal controls on cash and goods prevent losses due to these causes?

Principal Embezzlement Methods

1. Pilfering stamps.
2. Stealing merchandise, tools, and items of equipment.
3. Removing small amounts from cash funds and registers.
4. Placing I.O.U.'s, as well as undated, postdated and past dated cheques in change funds.
5. Failing to record sales of merchandise, and pocketing the cash.
6. Creating overages in cash funds, and registers by under recording.

7. Overloading expense accounts — false mileage, entertainment.
8. Lapping collections on customers' accounts.
9. Pocketing payments on customers' accounts, issuing receipts on scraps of paper.
10. Collecting an old account, pocketing the money and charging it off.
11. Collecting charged-off accounts and not reporting.
12. Issuing credits for false customer claims or returned goods.
13. Failing to make bank deposits daily or depositing only a part.
14. Altering dates on deposit slips to cover stealing.
15. Making round sum deposits — attempting to catch up by end of month.
16. Carrying fictitious extra help on payrolls.
17. Carrying employees on payrolls beyond actual severance dates.
18. Falsifying additions on payrolls.
19. Destroying sales tickets.
20. Altering cash sales tickets after handing copy to customer.
21. Voiding cash sales tickets through irregular explanations.
22. Withholding cash sales monies by using a false charge account.
23. Recording unwarranted cash discounts.
24. Increasing amounts of paid-outs in accounting for disbursements.
25. Using carbon copies of previously used original vouchers.
26. Using personal expenditure vouchers to support paid-outs.
27. Using a properly approved voucher of the prior year by changing one figure.
28. Using self-prepared "invoices" and falsifying approvals.
29. Paying false invoices obtained through collusion with suppliers.
30. Increasing amount of suppliers' invoices through collusion.
31. Charging personal purchases to company through misuse of purchase orders.
32. Billing merchandise to fictitious accounts for disposal.
33. Shipping merchandise to an employee or relative's home for disposal.
34. Falsifying inventories to cover thefts.
35. Diverting traveling or other business advances to personal use.
36. Cashing cheques made payable to the culprit's company.
37. Forging endorsements on cheques made payable to suppliers.
38. Inserting fictitious ledger sheets.
39. Deliberately delaying the reconciliation of a customer's account.
40. Making erroneous footings of cash receipts and disbursement books.
41. Deliberately confusing postings to control and detail accounts.
42. Rewriting ledger sheets to avoid detection.
43. Holding a cash receipts book open beyond the normal time.
44. Selling scrap materials and pocketing proceeds.
45. "Selling" combination to safe or vault for a price.
46. "Selling" the use of keys for a price.

As mentioned before most pilfering starts in a small way, stamps, cigarettes, or enough cash to pay for simple pleasures. It increases to pay current bills such as rent, insurance or time payments on household goods. This continues until disclosure occurs, or a real crook develops who is discharged or works out some sort of an arrangement.

Most auditors agree that once an employee begins to steal he seldom stops while the going is easy. This points up that an effective checking system safeguards the business against the incidents of stealing or at least makes it difficult to continue for very long.

The imprest cash fund is a popular place for theft. Raising of amounts on expense or express vouchers and pocketing the difference is a common device. Close inspection of supporting data will usually disclose the act since the culprit to completely cover must alter other paper work as well. Most companies recognize original vouchers only in order to get away from the carbon copy racket.

Cash sale businesses provide a lucrative source of funds for peculators. Usually under recording is done and the excess cash in the till is not removed until the end of the day.

Pilfering of goods from stores and tool departments accounts for a sizeable portion of the annual fraud bill to industry.

Some routine checks are made of lunch boxes and clothes but more imaginative ways of protecting this type of asset are usually necessary. One garage owner had constructed a large board on which the outline of all types of tools were painted. A quick glance at time of closing showed if all tools were replaced.

Burglaries may be inside jobs so it is well to conduct a thorough investigation when this occurs.

What can be done about the problem of business stealing? The principle that employees are honest until proven otherwise may not be a practical approach. To remove the possibility of temptations for fraud is the proper avenue.

A good system of internal control and audit is of major importance to every business. Systems men can also be of great help. Proper company procedures and forms can save all sorts of trouble and expense by preventing the "easy pickings" condition when most stealing starts. The public auditors of companies should be asked to do a detailed audit where no internal audit staff exists.

To confine the public auditor to a balance sheet audit and at the same time employ no internal means of checking invites theft.

A balanced system of prevention should provide in each situation for proper systems and audit work. This will be done singly or in a proper combination of internal and external audit work. To this should be added a reputable bonding company and control minded executives. The added expense of this "insurance" will more than repay its cost and seem small when the effect of continued embezzlement on your business is considered.

32nd Annual Cost and Management Conference . . .

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R. F. HATFIELD, R.I.A.
Chief Accountant,
Dept. of Highways & Public Works
Halifax, N. S.

TO THE MEMBERS OF THE SOCIETY OF INDUSTRIAL AND COST ACCOUNTANTS OF CANADA.

Traditional accounting principles and techniques have undergone many changes in recent years in keeping with technological advancement and changing economic conditions. The demand for new efficiencies has struck hard at time-honoured accounting concepts. In this age of Scientific Development, our Accounting and Management Services must, of necessity, explore all facets of these new techniques and evaluate the improvements made possible by them.

For those concerned with efficient Management Control, expositions and conferences offer an opportunity for an exchange of thought and a thorough investigation of the latest developments in accounting methods.

From June 23rd to June 25th inclusive, the Nova Scotian Hotel in the City of Halifax will provide the meeting place for members of the Society of Industrial and Cost Accountants. The latest Accounting Equipment will be on display and technical and educational sessions will be held regularly during the conference.

Committees have been active over the winter months making arrangements so that all the attending members, and their wives, will be given opportunities to enjoy the scenery, as well as the well known hospitality of our fair Province, and time will be so arranged that shopping time will be made available.

The success of our Conference depends on our Members from all the Provinces of Canada, and having in mind that the Conference of 1952 was held in Vancouver on the Pacific Coast, and for 1953 will be held in Halifax, on the Atlantic Coast, we are taking this opportunity of inviting a full representation of our Executive and all the Membership of each Province from Coast to Coast.

Cordially Yours,

President.

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32ND ANNUAL COST AND MANAGEMENT CONFERENCE

THE PREMIER
HALIFAX

NOVA SCOTIA

April 11th, 1953.

To The Members,
Society of Industrial and
Cost Accountants of Canada.

Dear Members:

This old province by the sea and its renowned and richly storied capital city of Halifax will, I am sure, be a source of pleasant interest to the visiting members of the Society of Industrial and Cost Accountants of Canada and their wives.

It is, indeed, a great pleasure for me to welcome you to our midst on behalf of the Government of Nova Scotia, and I know our citizens will receive you with that hospitality which is part of our Nova Scotia tradition.

Few other cities in Canada possess such a wealth of story as does this ancient city of Halifax. Here, when many another Canadian city was unknown, Halifax was a crossroads of the world. From its great harbour, merchant princes pushed their commerce into every sea-lane of the globe. Here still lingers the spirit of those great men of other days - - Enos Collins, Uniacke, Samuel Cunard, Joseph Howe, Haliburton, and a host of others who achieved national and international fame.

In war, this ancient fortress and its sister communities felt the impact of armed conflict, and at our very sea-gates, men of this nation went to their deaths in the last great world struggle for freedom. Here were assembled the great convoys that carried the fighting men and the fighting machines to battlefronts of the old world. Here was the b ase for the relentless sea and air patrols that were, inevitable, to turn the tide of the Battle of the Atlantic. Here have landed the victorious men of our armed forces, their job well done. Here, too, in more recent years, thousands of displaced and homeless people have landed to seek a new life, a new security in this great nation of Canada.

I sincerely hope that your meeting here will be a most pleasant and instructive one, and that many of you, in your leisure time, will come back again to enjoy the beauties of our province.

Sincerely yours,

Premier of Nova Scotia

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RICHARD A. DONAHOE, Q. C.
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April 14th, 1953.

To The Members,
Society of Industrial and
Cost Accountants of Canada.

Dear Members:

Halifax is proud to have been selected as the place in which the Society of Industrial and Cost Accountants will hold its 1953 Cost and Management Conference.

With all of Canada to choose from, you have decided to come to Nova Scotia, and it is our hope that when your convention is over, every member will endorse the selection of the meeting place.

Nova Scotia's pleasant summers, its friendly people and historic background should all combine to make your visit with us pleasant, worthwhile and comfortable.

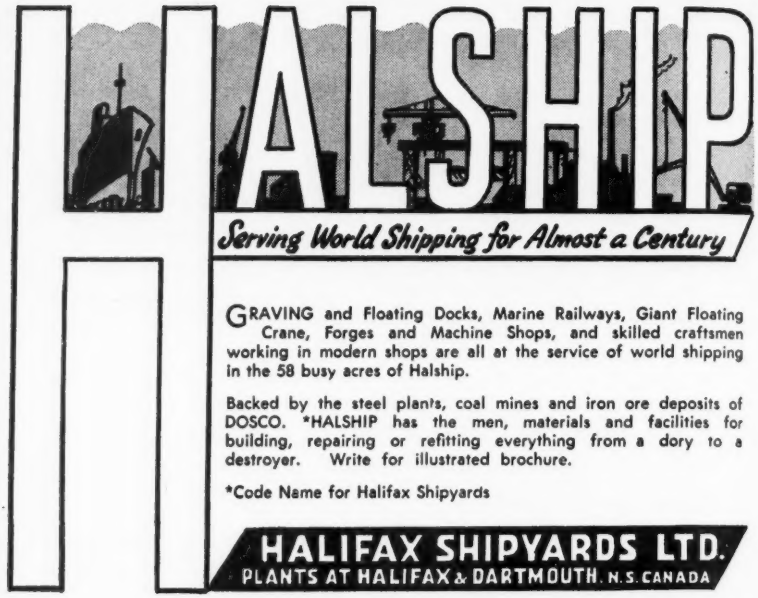
Nova Scotians pride themselves on being good Canadians while taking a particular pride in their own beautiful province. As good Canadians we welcome your members from other parts of Canada and extend our best wishes for a successful and enjoyable visit in our midst.

Yours sincerely,

Richard A. Donahoe

R. A. Donahoe,
Mayor.

RAD/mgv



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To the Ladies:

A most enthusiastic invitation is extended to the ladies to attend the 32nd Annual Cost and Management Conference.

Our Committee has been hard at work preparing a ladies' programme for the three days of the Conference which we feel will prove both interesting and enjoyable. No stone has been left unturned in our endeavour to set up a round of entertainment which we hope will make your visit to Nova Scotia really outstanding.

If you have enjoyed the beauty and hospitality of our seaside Province, we are sure you will look forward to revisiting us - but, if you have not, then, a treat is in store for you !

See you in Halifax June 23rd, 24th and 25th.

Yours cordially,

Florence G. Child

Mrs. W. L. Child, Chairman,
Ladies Reception Committee.

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Job Evaluation . . .

By L. R. CAMPBELL, B.Comm.,
General Supervisor — Job Evaluation,
The Bell Telephone Company of Canada

In this article the author outlines the factors which must be considered in organizing an efficient Job Evaluation plan. He then discusses the various types of plans now in existence and points up the value of Job Evaluation not only as an end in itself but also as an aid to many other business functions.

THE term "job evaluation" has numerous interpretations varying principally in depth as to just what it encompasses. I propose to deal with Job Evaluation in the commonly accepted sense, which is also the one used in our business. In this sense job evaluation is only one phase of a many-sided programme of wage and salary administration.

Most business concerns are faced from time to time with the problem of determining rates for jobs. This is particularly true in growing organizations where new jobs are created and existing jobs reorganized due to introduction of new methods or machinery. Or the problem may be larger, in that, having experienced growth in the business for some time and settled a lot of individual job problems as they come along, we now find that there are some unbalances in our rate structure which disturb employees and management alike.

Informal and Formal Approaches

There are two broad approaches we can take to such problems.

We can adopt an informal method based on our judgment of the overall job. This is the common method which we have all used at one time or another. As a general rule it is lacking in objective guides. It is more often than not a subjective approach being influenced by or considering the individuals involved rather than the requirements of the job assignments.

There are definite arguments and support for the informal approach. It is quick, simple, cheap, adaptable and responsive to changing conditions. The chief defect of the informal method is that it frequently fails to obtain all the facts, and results in judgments which are not defensible on solid and logical grounds. Employees in such situations are quick to refect any feeling of discrimination. To-day we pay attention to such unfavourable attitudes as we recognize that they affect performance.

The second method open to us is the formal one. This views the job apart from the incumbent. It considers the job content objectively and is concerned with getting at the facts. It may consider the job as a whole, or may analyze it in terms of factors involved. In most cases it employs the technique of pooled judgment of a group of people. The aim is to appraise and classify all jobs giving uniform consideration to

NOTE: Paper presented to the Society of Industrial & Cost Accountants of Ontario — Ottawa Chapter.

each, and to rank the jobs in accordance with their relative importance to the organization.

The formal method is commonly termed "Job Evaluation".

The Job Evaluation Process

(a) Definition

With this background we can define job evaluation in its proper limits.

Job Evaluation is a fair and systematic method of establishing the relative value of jobs. It is a method used to rate jobs, not employees. It should not be confused with other phases of salary and wage administration, including merit rating, which is a process of rating employees based on individual performance. If we accept that a job is a collection of duties or functions which form an assignment for the individual, then it is clear that the term "job" is concerned with the assignment and not the individual.

The process is systematic and formal in that we decide on a method of looking at each job, and agree also to apply this method uniformly to all jobs in the group that is our concern. It is a mistake to assume that the process is an exact science. Any thoughts along this line can lead us astray and into much argument and lost time. Job Evaluation should not be considered as precise or scientific for it has neither of these attributes. It is essentially a judgment process based on a systematic approach, and no claims can be made that it is mathematically exact. You may well ask, if it's not an exact form of measurement, what then does it offer? The answer is, it provides evaluation of jobs on a basis that is defensible, that is acceptable to both management and employees, and while maybe not exact, has a higher percentage of validity than any other method devised. In our experience we felt we were making a worthwhile statement when we were able to say: "It's at least 80% accurate, and that's a big improvement on what we had before."

Let us look then at the nature of the overall process and some of the considerations that must be taken into account. The same general considerations will apply whether we are thinking of a plan for the factory or shop, office workers or other salaried employees. The same essential steps will be used regardless of the type of plan we finally decide to adopt.

(b) Job Descriptions

The first step is to obtain a complete and factual description of each job, or of a representative sample of the jobs involved. The method of obtaining such descriptions can vary. Generally they should be prepared by someone with a working knowledge of the job, and approved by the immediate supervisor. It will become apparent at this stage, or later, that language will play a prominent part in the whole process.

Attention given at the outset to the use of clearly defined terms and a common language, will pay dividends in speeding up understanding of jobs required in the rating process.

(c) Key or Bench Mark Jobs

The second step is to select a series of key jobs. These are often referred to as bench mark jobs. These are just as important as the salary policy which guides you in the whole endeavour. They will provide the guide posts for judging the balance of the jobs. Bench mark jobs should be well established and readily recognizable jobs wherein the present salary relationship is acceptable. They should range from the simplest job to the most difficult. The jobs selected should involve as far as possible some that are common in the community. As the present relationship of key jobs is accepted, they can be readily ranked in order of importance.

(d) Ranking or Rating

The next step is to rank all jobs in order of importance or relative difficulty, comparing each one with the bench mark jobs to establish its rank or position on the scale. This process will be facilitated by assigning point values to the key jobs which preserve the relationship apparent in existing money values. This rating process affords an opportunity to introduce the use of the pooled judgment of a number of informed individuals rather than that of any single person. In most plans, rating is performed by a number of qualified appraisers, and their judgments will usually prove much more acceptable than those of any single analyst however qualified he may be.

(e) Pricing the Jobs

The next and final basic step in the process involves pricing the jobs and leads up to the adoption of a pay schedule or guide. Before this step can be carried out, management must define its wage policy, and in doing so, decide whether its general level of rates is to be equal to, or higher or lower than the market or community average. Determination of which rates are out of alignment in the general rate structure is a simple matter. This will show up by plotting existing rates on a chart the vertical axis of which represents money and the horizontal axis represents the difficulty of the work expressed in the points assigned to each job.

If a decision is made to establish a rate structure related to community wage levels, current wage survey information will be required. Data in respect to crafts or trades and clerical office workers can be obtained without great difficulty. That for management occupations presents more difficulty. In any case, it is necessary to proceed with caution in that broad assumptions as to the comparability of jobs may

easily lead us astray. In any wage survey we should carefully define the jobs on which information is sought, and accept only that information that applies to reasonably comparable jobs.

Having obtained information on the jobs in question, usually our bench mark jobs or a similar list, and after subjecting this information to statistical processes, we can plot a market line. Comparison of the market line with our previously charted present rate structure will provide guidance in respect to the adjustments we need to make to bring our own rate structure into the desirable relationship with the market.

The considerations involved in finally preparing a rate schedule or structure which we are going to recommend for approval are largely administrative ones. The job evaluation process produces a point value for each job. There are many obvious disadvantages to having separate rates for each job. Generally some form of banding or system of grades is desirable to facilitate administration. The decision as to what is the best system must take into account the particular needs of each business and the overall personnel policy of the business. In developing a banding basis some considerations to be taken into account are:

1. Like jobs should fall in the same band.
2. The natural promotional sequence of jobs should be recognized.
3. Differences between grades should be significant.

Scope of the Plan

Job Evaluation was defined as a fair and systematic method of determining the relative value of jobs. This can be qualified by adding three words "having common characteristics". The process is essentially one of systematic comparison of job with job. The process is easier and we are better satisfied with the answers if we confine our attention at any one time to jobs having like characteristics.

In our own situation having an appreciation of this point, we found our jobs could be grouped readily into several families. These were Plant craft jobs, clerical and office jobs, operators, and the management staff and supervisory positions. Each of these groups involved characteristics not found in the others. It would be much simpler to take one group at a time rather than devise and administer a plan covering all types of occupations. In our case we decided to start with the group of clerical and office worker occupations.

Many companies have made similar decisions. Having developed and placed in operation a plan for one group it has frequently been found possible to extend the plan to take in other groups, or to develop a modification using the same general principles for application to other groups.

A decision then as to the scope of the initial plan is one of the early decisions to be made in contemplating this field. In making this decision it is advisable to recognize that we can learn and acquire

experience in dealing with one segment only of the total problem. The experience gained can be usefully applied in dealing ultimately with the further segments.

Types of Plans

We have dealt so far only with certain basic considerations and the overall process. The nature of Job Evaluation is such that many refinements and alternative techniques are possible. There is no general agreement as to what is the best type of plan. Generally, plans are custom tailored or else carefully selected to fit the company's particular situation. It's not unlike buying a suit of clothes. You can pick up ready made plans, or you can do it the more expensive way and develop one of your own using any feature that appears desirable. Motor cars might be a better analogy than suits, as however you proceed, job evaluation is going to involve considerable expense.

Plans in use in industry fall into three broad types. These may be termed Simple Ranking or Classification, Defined Degree Point System, and Factor Comparison. There are any number of variations within these types.

(a) Ranking or Classification

In Ranking or Classification, each job is considered as a whole and ranked or classified in accordance with the judgment as to its relative importance. This may be done simply by ranking the jobs in order of importance or by classifying the jobs into grades or classes in accordance with a predetermined definition for each grade.

This system is simple to administer, easy to explain to the rating group and takes a minimum of time. It has some obvious defects. There is no assurance that the facts have been got at. It encourages rating on the basis of titles or personalities rather than on job content. It is difficult to defend to employees and to management.

(b) Defined Degree Point System

A number of factors are chosen which encompass most of the variable elements found in the family of jobs to be studied. Each factor is weighted to reflect its relative importance. Each factor is broken down into degrees. Each degree is defined in terms of job requirements ranging from high to low and a point value assigned. This weighting of factors and breakdown by degrees is accomplished and brought into reasonable relationship by a trial and error process, using the key jobs referred to as one of the basic steps in any plan.

Each job is considered factor by factor. It is measured against each degree definition to determine the one which is most applicable.

The sum of the points awarded under all factors is the total point score of the job. The relative scores of two or more jobs indicate their relative value.

The advantages in this system are several. The systematic review of all factors makes for consistency and uniformity in rating. The effect of personalities in determining job values is minimized. Probably most significant is the fact that results are defensible in that the reasons and substantiating data for ratings awarded are on record.

There are admitted disadvantages also. It is time consuming, hence costly. Considerable training in the use of the techniques is required. Selection and defining of factors and degrees is difficult and necessarily to some extent arbitrary.

(c) Factor Comparison Method

A number of variable factors are selected. These are usually fewer in number and broader in scope than the factors used in the Defined Degree System. An example is the General Foods plan on which many other companies have patterned their salary plans. In this plan three factors are considered, — Knowledge, Decisions and Responsibilities involved.

As in the general process, which I have described, a number of key jobs are selected. Each key job is evaluated in terms of each of the chosen factors. The rate of each key job is apportioned to each factor, in accordance with its estimated importance. The result is a rating scale under each factor.

All remaining jobs are then slotted into their correct places in the rating scales. Each job thus gets a point value under each factor and the sum of these values gives the total value of the job.

Under this type of plan the rating scale is usually tailored to the particular enterprise. This avoids the inaccuracies which may be present in adopting a ready made scale.

This type of plan makes for objective consideration of jobs and minimizes the consideration of personalities. It can also be argued that more consistent results follow from job to job comparisons than from comparisons of jobs against generalized definitions.

On the debit side it must be recognized that this type of plan involves a great deal of committee work and that the detailed con-consideration of each job is time consuming.

Development of the Plan

(a) Selection of the Plan

Having looked at the nature of the overall process and the types of plans available, I would like to point out some of the considerations involved in the development of a job evaluation plan to fit any particular enterprise. In the matter of selection of a plan we have seen that there is choice between simple, inexpensive types of classification plans and the more involved factor comparison and defined degree types which call into play analyses under various factors. There is

no ready made formula to tell us what type will best suit our purpose. The decision here will depend upon analysis of our situation and its particular needs. Recognizing that job evaluation is only one phase of wage administration, the decision will have to consider the relative importance to an enterprise of a set of well balanced wage or salary rates. This may vary between individual companies as the relative importance of the total wage bill varies. It may vary in respect to the degree of competition in an industry.

Another factor which may have a strong bearing on the selection of the type of plan will be the nature of the labour relations situation. Those companies involved in collective bargaining with their employees, and those who see bargaining as imminent, will place more importance on a satisfactory plan of job evaluation.

(b) Rating Committee

A further major decision required lies in the problem as to who should do the rating of jobs. Generally this function is assigned to a committee both in the initial and continuing administration stages. In some instances it is found that after the initial installation, this function can be assigned to a centralized staff group such as the Industrial Engineering Department.

One element to be considered is cost in relation to time required to do the job. We want also consistency in rating which will require a certain amount of continuity in personnel involved. The pooled judgment of a representative group of people whose overall knowledge may embrace most aspects of the business, is much more liable to produce ratings that will be acceptable, in contrast to the judgment of any single individual no matter how well qualified he may be. The fact that pooled judgment of a group is employed will prove to be a strong selling point in gaining acceptance for a plan.

Committees do not need to be large. In fact they will be much more effective if kept to a minimum representation of one member from each major department or division of the plant. A committee of four to six members with a co-ordinating chairman will be ideal for most situations.

Committee members should be selected for their analytical ability and consideration must be given to status. Participants in the committee should be higher up in the organization structure than those whose jobs are being evaluated.

Continuing Administration

I have already touched on the point that a considerable investment may be involved in the plan and that we must be prepared to service it. It is a fact however that in many instances job evaluation plans have failed due to lack of appreciation of this need.

What are the problems involved and who is involved in keeping the plan going once the initial installation is completed?

The chief problem to be recognized is that jobs and organization are not static. Changes due to growth, new methods or changing requirements are occurring constantly. If we are sufficiently concerned about obtaining the facts in order to establish the relative value of jobs, we must recognize the need to keep those facts up to date. This all means that we must set up machinery to deal with new jobs and job changes. The responsibility for identifying and presenting information in respect to such changes must be assigned clearly. The committee function must be a continuing one. There must be some central co-ordinating function, usually vested in the Personnel Department, who will keep control of the whole process, police it to some extent, and maintain and issue the necessary records.

In addition there must be provision for periodical review of jobs to assess the present content in relation to the description on file and to check the rating. This is a difficult point to administer, but the problem must be faced and overcome if the plan is to stay alive and healthy. Education of management and employees is another phase of continuing administration that must be kept in mind. Over a short period of years there can be wholesale changes in personnel in both groups. New management personnel must be indoctrinated in accordance with their role in the overall programme. With to-day's pressures this is often difficult, but must still be regarded as essential.

Impact of Job Evaluation on Collective Bargaining and Wage Grievances

Various surveys have been made of Job Evaluation by the Industrial Relations Centres of universities both in this country and in the U.S.

The two specific advantages most commonly found by such surveys are that job evaluation has brought about an equitable rate relationship into a previously unsatisfactory situation, and secondly, that it has been of great assistance in colletcive bargaining. A third advantage often stated, which is probably directly related to the first one, is a reduction in the number of wage grievances.

There are numerous reasons why job evaluation is an aid to collective bargaining. Job rates set according to an impersonal and predetermined system are more easily justified and defended than those determined by personal judgment of a single person. Emotions and personalities tend to be ruled out by this process. Wage negotiations are considerably simplified once the union accepts the job evaluation plan. It is then possible to bargain a general wage adjustment based on job evaluation relationships. The slow process of bargaining rates for each job is avoided.

The question arises frequently as to how far the union and management should jointly participate in a job evaluation programme. There is no general agreement on this point and experience has varied widely. Job evaluation is essentially a management tool, and it can be argued

that management should protect its prerogatives in every way possible. Against this is the fact that some companies have found it expedient to allow union participation in most phases of the plan. One Montreal company cites as their experience an initial attempt to install Job Evaluation in the shop without union participation. This attempt failed, while a second try with union participation was successful.

The answer to the problem in any given situation probably lies in the thought that any arrangement which will promote harmonious industrial relations is worthwhile. If the union is present now the whole issue becomes one of bargaining and it may be necessary to bargain a basis wherein the union participates in the process.

Under job evaluation it is general experience that wage grievances tend to be reduced to a minimum. Most plans will involve some type of appeal machinery as an integral part of the plan, wherein employees or management can appeal any job ratings. With such machinery available, grievances are confined largely to questions of job content and proper classification.

By-Product Values

I have referred to some of the direct values resulting from job evaluation programmes. It has been general experience that, aside from these, there are a number of concrete by-product values.

The process must be based on facts. To get at the facts we require a description of the job indicating duties and responsibilities involved. Writing such job descriptions is not quite as simple as it sounds. In the shop or factory job operations may be well defined. In office work and management jobs the duties may not be clearly established depending in some cases on the individual incumbent. Hence often we must assess what is being done and decide whether or not that is the requirement we are paying for or wish to pay for. Inevitably we get into considerations of job organization and overall job requirements. In looking at each job we must ask — is it set up on an economical basis? Does it allow the degree of flexibility in assignments we require to get the overall job done? Does such an assignment provide a step in the natural ladder of progression? I think that as accountants you here may have more appreciation of the worth of this type of study than other elements of management.

Job descriptions once established will be found useful for other purposes. They provide the basic data needed in setting up adequate employment specifications. In our business we found that they provided basic information from which we built up employment tests fitted to our particular needs. It is generally agreed also that job descriptions are an invaluable aid in building training programmes. I think it is a fair observation that those in the process of building a programme for personnel administration, will find it most useful to put job evaluation

in the forefront, as the basic data developed will prove useful in many other aspects of the programme.

So far we have looked at the subject largely from the management viewpoint. We should in fairness attempt to look at it as well as we can from the employee's viewpoint. What is the effect on performance if an individual feels that his job rate is unfair, or does not properly recognize his contribution? Let us remember too that each person will view his situation in the light of his own knowledge and experience. There are certain needs that are present in everyone no matter how big or small his job. We want fair treatment particularly in relation to that accorded others in the same shop. We want freedom from discrimination. We want the self satisfaction and status recognition that is possible only when due recognition is given to our job in relation to others.

When we have these things we have in part at least the emotional security which allows us to contribute our best efforts. Job evaluation can do much to satisfy some of these natural wants. It is based on facts, not opinions. There is uniform appraisal of each job. Ratings are the result of pooled judgment of a group of experienced people. Knowledge that the job has been rated through this process does much to satisfy the human needs involved. If we have studied the human factor in industry to any extent, we will recognize that those things that satisfy the needs of the individual can be counted on to contribute to better job performance.

Summary

To sum up, I would like to put together a few observations that are related to the success of any job evaluation programme.

We should have a well thought out method that is related to our particular needs.

The type of plan is not so important as the purpose of the plan and our method of installing it.

We must have top management acceptance and backing.

Through participation methods we will build the type of atmosphere in which acceptance is possible. We will be more concerned about ultimate acceptance than we are about the time it takes to install the plan.

We will use methods that recognize the need for consistency in rating.

We will recognize that job evaluation is only a tool. In some situations a simple tool is more valuable than a complex one. A good tool needs continuing care to keep it useful and effective.

Finally, and here I paraphrase a statement from the January Royal Bank Monthly Letter, as management in the introduction of any programme we will endeavour to maintain a balance; we will formulate principles, take advantage of theory when it accords with principles and common sense, and cling closely to the practical.

How to Win Friends and Influence People Through Budgets . . .

By N. R. Barfoot, R.I.A.,
Budget Supervisor,
Fiberglas Canada Limited

The author contends that the budget has become a pressure document to both factory and financial management and has created many problems in human relations. In this article, the author outlines some of the situations arising from budget practice and suggests various means for creating a favourable attitude toward the principles involved, rather than toward the figures.

SINCE the early days of this century, managements have developed techniques to help them plan and control the complex operation of business. A major contribution to this effort has been made by the financial branch. Cost accounting, standard costs, statistical studies and budgeting are some of the special instruments evolved in this century for the assistance of industry.

These management aids, for the most part, have reached a high degree of efficiency. Books and articles by the hundreds have been written. Talks by the score are given to accounting and management groups. Formal lectures at the college level deal at great length with scientific management. With this wealth of effort the special methods of business planning and control should be known to all.

We have devised the tools to manage. Do we know how to use them? I suspect not too well. We complain of the lack of good foremen and supervision. We feel that personnel departments should be strengthened. Lectures in human relations spring up in the midst of traditionally staid Finance courses. There is glib talk on the part of some about a new and somewhat terrifying thing called social engineering. Aptitude tests are the order of the day.

There is indeed much confusion and we wonder why our perfectly thought-out techniques often fail to produce results. The answer is rather simple; the solution rather complex. It follows that we must believe in people more than we believe in methods and techniques.

I should like to deal briefly with the human element as related to one form only of control technique, namely; the budget. This selection is not because budgets are particularly unique in business human relations. They are just one of many administrative processes bringing out certain kinds of human reactions.

The Budget and Factory Supervision

Let us look at budgets through the line supervisor's eyes, as well as the accountant's. Let us see how these people really feel about budgets; the budget process and, not least, the people involved in making and administering them.

Perhaps from this examination we can make an analysis of the relationship between budgets and people. I won't be authoritative, since such a subject prohibits ex cathedra statements. Every case is different. Circumstances are constantly changing. People not only react differently to each set of conditions, but may not react the same way twice to the same set of conditions. Sounds difficult! And so it is. I don't believe there can be a system of techniques or a pat set of rules to deal with human relations. In other words, you cannot tie up human nature in neat little bundles.

However, perhaps we can develop an awareness of the pressures and conflicts in the other fellow and in ourselves. With an understanding of the causes of tension we can perhaps bring about a better means of working together. Perhaps even budgets and other similar business devices for control can be seen in their proper light of impersonal utilitarian documents.

In this article I intend to raise many old problems and probably too few new answers. I intend to be very frank about the failure of budgets and budget people and only so in the hope that we can do some real thinking on the subject.

First of all, let us look at the ideas and attitudes of the factory line supervisor to budgets. Let me be blunt. The front line supervisor makes far less use of them than we think. He will say: "You can't use them with the production worker. My boys are doing their best . . . they are not lazy. If I put the pressure on them through budgets they will think it means the old management whip."

This type of supervision is forced to refrain from mentioning budgets. He may try to accomplish what the budget supervisor desires by translating budget language into shop jargon, but more often than enough he says nothing.

The top supervisor or production superintendent is in a different position. He uses budgets quite frequently with line supervision in production and budget meetings. He uses budgets as a means for cost reduction with the foreman. He believes in budgets to a greater degree and thinks they improve his management technique and his position with top management.

It seems obvious that the closer supervision is to labour, the less use is made of budget pressure. One becomes curious about the middle grade supervisor who receives all the pressure from above and cannot pass it down.

What does factory supervision think about the mechanics of budgeting? Here is one major complaint that has been heard by every budget man, and, unfortunately, is too often true.

Budget reports never show the real reasons why standards have not been met. They never take into consideration all the variables that affect production. Budget explanations usually say what caused the trouble but not why, or the why understood by the supervisor.

Is there a point here? Are finance people worrying about figures only, whereas the foreman must be concerned about the feelings and personalities that caused the figures?

Most budget and finance people are inflexible and dislike change. Is that true? Once established, budget people seem to dislike changing standards. Have you ever heard that?

I attended a budget meeting a while ago during which a foreman said: "Last month we agreed that standards were wrong on materials and yet here again the figures show the same high waste. How come?"

Is it surprising that one of the accountants present said: "Good gosh, you know we can change standards only once a year, and look what it would do to our work in process accounts if we did change."

Of course the financial man was correct from his standpoint, and I might say a limited one, but this is Greek and nonsense to factory supervisors. How would you handle this situation?

Do budgets cause the supervisor to do a better job? Are they the chief or only motivation the supervisor has? Do they really keep him on the ball?

Most supervisors agree that budgets help, but strongly resent that they are the prime motivation to do a good job. To accept budgets as the activating principle of good foremanship is to imply that foremen do not have an adequate interest in their jobs. In other words, he will probably say: "I can use them but I don't need them. If anything is wrong or out of order with my department, I change it, not on account of budgets but because I am interested in doing a good job."

Budgets are not realistic. The goal is too high. These are common expressions. In this situation the supervisor is put into the position that he can never succeed. Management may feel that the supervisor's own desire to do a good job is not sufficient to meet attainable budgets.

Pressure by way of higher goals is an accepted way of needling this type of supervisor into action. I wonder if it really succeeds? Perhaps the real net results of setting too high a goal should be considered.

The supervisor often realizes many of these difficulties outlined above and may even offer solutions. What is his answer? Perhaps it will appear like this.

The financial people should learn to see the other persons' point of view.

Budget people should undergo some training to learn budgets are not final — they are merely opinions.

Financial people should change their belief that the employee is lazy and wants to do as little work as possible.

Financial people should change their belief that the best way to get good results is through pressure.

Financial and accounting people should be taught that they are not superior to factory supervisors.

These comments are strictly those of the factory supervisor.

Budgets and Financial Supervision

Now, what are the ideas and attitudes of financial people to the budget? What do the people who prepare and administer them think?

Obviously they think budgets are important. They feel that budgets portray the significant financial conditions in the plant and provide most of the answers.

Budget people, therefore, see their job as one of constant examination and analysis. They must be looking constantly for new ways in which the plant can achieve a greater degree of economic efficiency. The whole principle is bound up in a technique and method that permits the measuring of performance and fixing of responsibility.

Budget people are critical, they are never satisfied. Is this right?

They are operating the principle of exception; therefore, they put the emphasis on the things that are wrong. They feel all errors, omissions and weaknesses must be reported to top management as a matter of duty. Budgets are, therefore, top management control instruments and as such increase the importance of the budget and significantly for our study the budget man. There is also a third emphasis on timing. Historical results are bad, current results good.

Financial people believe therefore, that the budget is a means of pressuring the supervisors into action quickly. They usually feel also that there is an inherent laziness, lack of initiative and indifference to results in factory people and, therefore, the budget as a pressure document is good. They believe budgets present a goal, a challenge to factory people and, without these checks no results would be forthcoming.

What is your biggest budget problem?

Most budget men will name as No. 1 problem the selling of the budget principle to the supervisor. The reasons given for the difficulties in selling are lack of education, lack of interest, misunderstanding, and mistrust of budgets. This is felt to be a herculean task, which points up something about the attitude of financial people to human relations. Do you notice that obtaining agreement of the priniciple of budgets with others is the difficulty and not the budget itself?

Budget people also make some analysis of the factory supervisor's attitude and this is what they usually say.

Factory people tend to be too liberal and too humanitarian towards people. They think in a short term way. They are not trained in figures and have no respect for costs.

On the other hand financial people think of themselves as cold logical fact finders. They say: "I am trained to interpret results, look at figures only, and I have no time for personality differences. That stuff is all right for the personnel office, but I must get the story, get it fast and fix the who and what in each situation."

This thinking gives some indication for understanding how problems arise between budget and supervisory people. If foremen do think in short terms, are too easy going and have no regard for costs, then they are in direct opposition to the budget-thinking principles of budget people.

I have described above very briefly the attitude, ideas and opinions of those who make budgets and those who use them. Perhaps a few minutes' discussion of the problems raised would be of benefit. Who knows, we might be able to get a glimmer of an answer in this admittedly difficult business.

Are Budgets Pressure Documents?

The explanations in the first part of this article did develop the fact of pressure. The budget basically becomes a pressure document from top management to line supervision. Not the only pressure but certainly a major one and it is easy to see why this is so.

Most managements are faced with rising costs and a sales structure that does not rise in direct proportion. Profit margins diminish. The tried and tested answer for industrial survival is increased productivity and lowering of costs. There is a tendency for productive effort to become stabilized in each new sales period. A goal has been set and perhaps met. The next fiscal period finds a new set of economics in existence and the manager must set a higher goal to meet his responsibility to the shareholder.

Both budget and factory people are now working harder to keep up production and hold the new budget. It is not difficult to see that tensions develop. This constant increasing pressure makes factory people suspicious of each new move. Budgets become one of the main targets, since it is one of the techniques most frequently employed to increase the pressure for lower costs and higher production.

This tension may lead to inefficiency, aggression and perhaps even a complete breakdown on the part of the supervisor. This happens not only to the group under pressure, but to the group exciting the pressure.

Pressure must be relieved or compensated for. Extreme cases result in a physical breakdown. The quiet types bottle up the pressure, work long hours, attempting to overcome the feeling of pressure. Extroverts talk faster and faster, roar commands and request prompt action no matter what the urgency. Nearly all feel some relief by blaming the staff financial people, production control or the sales department for their problems and, of course, the budget.

The long term results of such a programme are inefficient thought patterns, loss of memory, over-delegation of responsibility and indecisive, flabby decisions. Anything can happen in the scramble to escape the pressure and tension.

Should the Budget Measure Success or Failure?

Another important human relations factor accruing out of budgeting is this business of success and failure. Most experts would say that success is important to everyone. People constantly lay plans, both important and trivial, work to complete them and, as they are met, feel successful.

Both the financial man and the factory supervisor want to feel and be successful. Both desire praise and a sense of continued accomplishment.

You will recall that the budget man perceives his task as the watchdog of the company. If he doesn't apply pressure through budgets, report on bad conditions and constantly tell himself that there is always room to make it better, he doesn't feel he is doing his job. In other words, a good financial man or budget man or, for that matter, any one exerting pressure through controls, for a large part is only successful if he finds things that are wrong.

When these errors are discovered, the budget man usually feels duty-bound to report not only on the mistake but fix the responsibility.

In so doing, the tendency is to make the foreman at least feel inadequate, or in extreme, a failure.

The effects of failure and success on the foreman are just as serious as they are on you. There is nothing unique or special about your little private hells of failure. Everyone experiences it.

Here we have the interesting and crucial situation in which success for one party means failure for the other. The net result is that the originial idea of the budget is lost. This document, which is an impersonal periodic plan of statistical and financial aims, now becomes the official whipping boy.

The supervisor's efficiency is judged then by budget success. If a supervisor would feel successful, he will do so when he meets his budget.

"Meets his budget" is a significant phrase. Everything in the budget process emphasizes his department, his mistakes, his department errors. In other words, his department versus other departments. Any number of inter-departmental situations can be imagined which suggest the conflicts that can arise in the protecting of his department. The measure of the department supervisor's success shows in the budget.

We all have difficulty, many times, in fixing responsibility for errors, not out of ignorance of the real locale, but of the human relations problem resulting from pointing out the author of the mistakes. This same problem occurs in dealing with the foreman on budget matters.

Budgets, as usually administered, foster this narrow departmental viewpoint. Supervisors become department centred rather than plant centred. This has a serious influence on costs — e.g. — protection of

non-productive staff and fear of reduction of staff in case it cannot be reclaimed when needed; to be blunt narrow departmentalism encourages feather-bedding and padding of all sorts — something, I hope, we think about from a preventive standpoint.

The Human Relations Problem

The budget often becomes the centre of all emotional outbursts. There is a distinct tendency to project into the impersonal cold figures of the budget all the emotions and feelings at your command. Supervisors often say: "Budgets get me upset." This is not accurate. It is not the budgets that cause the upset, it is the people who make and use them. The budget becomes the centre of tempestuous outbursts about mistakes of all sorts; most of them not even remotely connected with it. We now have the budget developing patterns of thinking and of leadership.

There can be then, four basic human relations problems arising out of the budget process.

Budget pressure tends to place the supervisor under tension. This leads to inefficiency, even aggression and perhaps complete breakdown.

The finance staff can be successful only by pointing out the errors of the plant people. This interplay of success and failure leads to many psychological distrubances both for the staff and factory people.

The use of budgets as a prod to efficiency makes the factory supervisor see only his problem. It fosters departmental thinking as compared to the highly desirable overall plant outlook.

Finally, budgets become a medium of expressing emotion and patterns of leadership. The final result is that the budget, a harmless neutral thing, is blamed.

Are there any solutions to these problems? If there are, it seems probable they are in the field of human relations and not in the realm of budget technique. I would like to emphasize once again that there are no packaged answers and any comments made are purely suggestive.

Winning Acceptance of the Budget

I would like to suggest two areas in which some action may be taken which can prove remedial to the problems arising out of budget practice.

The first is that of participation in the budget process. Closely allied is a sincere and true acceptance of changes in the goal.

Nearly everyone on the control side emphasizes the need for participation in budget work. This is good, but many budgets are set from past records, with little say by the people who are responsible for them. The financial man almost always feels superior in knowledge to the supervisor in all matters of the budget. There is a grave tendency to rush through the process with mental reservations by the staff man, that it is a matter of form and the quicker it is over, the quicker I can set my burden rates and get on to other matters.

However, even if the supervisor looks at the figures, nods and signs, has he really participated? If he does not really accept them, but only says so, then trouble is in existence. Pseudo participation will not do.

Let us examine this business of participation. I do not believe the responsibility for overall goals or targets can be shared by management with lower line supervision.

Managers and owners alone have all the facts and the responsibility to shareholders to determine the course of the business.

However, the path by which these goals are to be met can be decided upon co-operatively by the interested employees. New standards and new objectives are accepted if individual members in groups can come together, freely discuss all the aspects concerning the new objective, and take part in laying out the course of action by which these goals will be accomplished.

To obtain acceptance of a budget change, or a change in goal, it must be borne in mind that we are not just selling a new budget or new goal. We must unsell the old one. A lot of work went into the first effort and certain thoughts and impressions concerning it were cemented into the supervisor's mind. A certain set of ideas, attitudes and values exist concerning the old budget. These must be carefully changed and I suggest in group.

Any change in budget figures, methods or goals involves the following steps.

(a) Finding out the supervisor's present feelings, attitudes and values concerning the budget process.

(b) Assisting him, in group, to unfreeze these feelings and attitude.

(c) Helping him through his own group to discuss, and accept the new attitude and values attached to the new budget. The group participation in this process is vital.

(d) Helping him through his group to cement in the new ideas and values attached to the revised budget.

(e) Helping him, throughout the whole process, to feel that he is an important member of his own supervisory group and also an individual. A group which we can join at will, is one that we feel will help us to be what we want to be. The idea of collective security — a united front against the budget is not present.

Acceptance of the figures is not the critical point. It is the frame of mind and the attitude towards the principle involved. Figures then become what they really are — a means to an end and not the end. Again, as I said at the start, we must believe in people more than in methods or means. Supervisors resist change, and not because of the figures per se (assuming the figures are fair). They resist because of attitudes and feelings about the company, about their work group, the

finance people and budget supervisor. Their insistence that the figures are unfair is a symptom of resistance and not cause of resistance.

To achieve success, in the budget process, the line foreman must be able to drop caution and suspicion and learn to expect honest and sincere participation.

It is best not to sell something until you have developed a need in the buyer. This is not done by telling how good the product is. By demonstrating the faults of the old and getting agreement, we are ready to institute a system to do away with the faults.

We do need patience in this matter — after all we took hours and hours to get a budget together. How can we expect a sudden dramatic change overnight by the foreman?

Do the work in groups. Acceptance in groups is always better received. It gives a sense of overall approval and breaks down the feeling of "my department versus your department" when we see and hear, and perhaps participate, in the entire budget process.

Their suggestions, which must be cut to fit the individual situation, should help to create active acceptance of budget changes through a process of active participation.

The second area in which some suggestions can be made is in the strict field of human relations. Almost everyone outside of the accounting department realizes the narrow-minded rigidity of most finance people. It is partly a failure of the educational system and partly tradition. There are text books by the score on budgeting and accounting but nothing on selling accounting. Staff finance people are mainly technicians.

Historical accounting never had to do much selling or explaining of its place and work. However, a more involved, more useful type of managerial accounting has been thrust upon the profession in the last 25 years. Consequently the old attitudes exist through experience in some and association in others.

This failure on the part of the accounting people is serious. I believe training in human relations during the regular instruction periods is necessary, as well as such training in industry.

The following specific suggestions might be made.

1. The finance staff should have their attention focussed on the human implications of the budget system.
2. The finance staff should understand the effects of pressure on people. The advantages and disadvantages of applying pressure.
3. Discussions should be had about the effects of success and failure. The accounting people should realize their difficult position — that of placing people in the failure group. The symptoms of failure should be understood. Practical techniques on getting along with factory people should be studied.

4. The department-centered thinking of supervisors should be dealt with and the influence of budgets on this thinking shown as a defense rather than narrow-mindedness.
5. The basic content of human relations needs to be studied. Such things as the concepts of formal organization, industrial organizations, social systems, interviewing and leadership should be given some thought.

Consideration of these subjects should help the staff budget people become aware of human problems in the industrial organization. From here will develop understanding of the actions of others and ourselves. We will realize that a gradual change in attitude of the line supervisor is necessary and desirable and also in the accountant.

Perhaps this brief outline has shed some light on the subject of how to gain acceptance, real acceptance of goals and standards. However, if it serves but to arouse in some of us sufficient doubt that we feel compelled to read, discuss and investigate further, this article will have served its purpose. It is certainly not exhaustive and touches only here and there on this involved and broad subject.

O. H. MENZEL, R.I.A.

It is with much regret that we announce the sudden death of O. H. Menzel, R.I.A.

A Past Chairman of the Hamilton Chapter, Mr. Menzel devoted many hours to the work of the Society and was responsible for much of the success of the organization in the Hamilton area.

To Mrs. Menzel and the family we extend our deepest sympathies.

PERSONALS

John R. Griner, R.I.A. was recently appointed Assistant Treasurer of Stone and Webster (Canada) Limited in Toronto. Mr. Griner is Assistant Secretary for the Toronto Chapter of S.I.C.A

C. W. Harris, C.P.A. became Comptroller of Art Wire and Iron Co. Limited on May 1st. Mr. Harris is a member of the Toronto Chapter.

Synthetic Standards— How Good are They? . . .

By Hugh J. Vallance,
Supervisor, Industrial Engineering,
Canadian Johns-Manville Co. Ltd.

After defining predetermined time standards, the author vividly demonstrates, by a single illustration, their application in estimating production of new work methods improvements and rate setting.

A LITTLE over seventy years ago, a young man by the name of Frederick Winslow Taylor realizing that there was a definite pattern to every operation, which repeated itself in somewhat comparable fashion every time it was performed, decided to examine this fact and study its ramifications as fully as he could. Thus he started to develop those theories which were to bring him the title Father of Scientific Management. His ideas have most certainly made industrial history and have contributed tremendously to making Canada and the United States the leaders of the world productionwise.

Undoubtedly you will immediately associate his name with Time Study and Piece Work as it was once called. Granted he did originate the use of the stop watch to measure work, but Piece Work, as such, actually dates back to the days of the Babylonians. His theories did, however, cover a much broader field and his thinking was years ahead of his time.

One of his ideas was that there is a proper time for doing all work and that this time could be found by means of the stop watch. He also believed that work is made up of separate steps, or elements, and that there was a proper time for each element. This time along with careful descriptions could be recorded for future use. Eventually, this record would be so complete, he believed, that timing new jobs would be unnecessary. The time for a new job would be found by listing the elements of work to be used and reading the times for these elements from the records, the total of these times would then give the time required for the job. This procedure is what we refer to to-day as Standard Element Time Data, which has been and still is, of immense value to the Industrial Engineer. When you consider the volume of standard data of this nature required to establish standards for a single shop, plant or mill, you will realize that Taylor's plan, applied to industry to-day, would require a complete library to house this information — for those industries represented here to-night. Even then, this data could not be applied to similar operations and industry elsewhere, unless performed in an identical manner, under identical conditions and using identical tools — a rather Utopian situation. Obviously this dream of Taylor's may have been practical in industry as he knew it, but it would

NOTE: Paper given to the Quebec Chapter, Society of Industrial and Cost Accountants of Quebec.

not apply to-day; most certainly, nobody working 70, 50 and even 25 years ago could visualize the progress, expansion and variety industry enjoys to-day.

The next step was developed by Drs. Frank and Lillian Gilbreth when they introduced their theories of motion analysis and their development of Therbligs. Unfortunately, their teachings unintentionally set in motion a definite division between Time Study and Motion Study, to such an extent that separate departments within the same company were established, departments entirely separate in every respect.

During the past ten years or so Industrial Engineers have expressed an ever-increasing interest in all pre-determined time systems. In the past five years this interest has expanded to such an extent that a revolution is taking place within the comparatively small field of Industrial Engineering.

As in every revolution, two factors are involved. On the one side are Industrial Engineers and Managers who adhere to the older and well-known system of conventional time study. The other side is staffed with the proponents of a system of predetermined motion times.

In this revolution there will be no blood-shed and little emotional upheaval, masses of people will not march. All this will be replaced by the expressed vote of experienced and thinking people.

For my part, the outcome of this revolution is not in doubt. For the past twenty years I have maintained, that some of the principles associated with benefits of pre-determined motion times were the only logical answers. Possibly I had the bull by the tail but didn't know how to throw him.

System of Predetermining Motion Time

To the best of my knowledge, there are four systems of predetermined motion time which were independently developed and are being used at the present time. The oldest of these is that developed by Seegar; however, this system has been kept on the secret list and very little, if anything, is known of it by Industrial Engineers in general. The first system to be published was that developed by a group of Industrial Engineers at R.C.A. Victor during the last war and was first published in Factory Management and Maintenance in 1945 by Messrs. Quick, Shea and Koehler. This system is known as Work Factor and is available from the Work Factor Company, Cleveland, Ohio. In 1948 the findings of Messrs. Maynard, Stegemerten and Schwab of Methods Engineering Council were published in book form under the title of Methods Time Measurement. Both that year and subsequent ones articles on their findings have appeared in Factory Management and Maintenance, Fortune and several other publications. In Canada the consulting firm of Stevenson & Kellogg Limited are the agents for Methods Engineering Council in training and applying M.T.M. A few years ago the Canadian

consulting firm of J. D. Woods and Gordon introduced their procedure known as Basic Motion Timestudy, or B.M.T. Details of their findings were published about a year ago by the Financial Post. Before somebody tries to put me on the spot by asking which system is the better one, I wish to state that I have seen the three systems — Work Factor, M.T.M. and B.M.T. applied and when used by experienced Industrial Enigneers, versed in their respective system, the results are practically identical. Certainly, there is a difference in the technique involved in each but they all lead in the same direction and arrive at similar conclusions. The comparison between them is very much like the comparison between continuous stop watch readings and snap back readings for conventional time study, this has been a bone of contention among Industrial Engineers for years. I have used both systems extensively and can find very little difference in the results.

What Are Predetermined Time Standards?

Now just what are these predetermined time standards or synthetic time standards as they have been called? Will they replace the stopwatch? What will they do? How are they handled? Are they any good? Being more familiar with Methods Time Measurement I will answer in terms of M.T.M., though the same could be said for Work Factor or B.M.T.

First — what is M.T.M.? "It is a procedure which analyses any manual operation or method into the basic motions required to perform it and assigns to each motion a predetermined time standard which is determined by the nature of the motion and the condition under which it is made."

Thus it may seem that Methods Time Measurement is basically a tool of methods analysis that gives the answers in terms of time without the necessity of making stop watch studies. This is true up to a point and that is when the assembly or manually controlled operation is limited by the process. In other words M.T.M. cannot be applied to operations controlled by the process. Hence M.T.M. or the other systems will not entirely replace the stop watch.

The unit used to express time involved in M.T.M. data is the direct result of the thousands of feet of film analyzed when determining the various factors of M.T.M. This film was projected at a constant rate of 16 frames per second so that some unit had to be selected which would represent 1/16 of a second and which could readily be converted to minutes or hours. Obviously a fractional figure could not be used. For this reason the Time Measurement Unit or T.M.U. was established and 1.7 T.M.U.'s equals 1/16 of a second. Expressed in more familiar terms 1 T.M.U. equals .036 second or .0006 minute or .00001 hour. Dealing with time in such small yet measurable units indicates the exactitude which can be realized when this system is employed.

All the factors of M.T.M. are shown on this Data Card which are Reach, Move, Turn and Apply Pressure, Grasp, Position, Release, Disengage, Eye Travel and Eye Focus and Body, Leg and Foot Motions. Thus the motions involved in any manually performed operation are accounted for. In view of the fact that the time values are those required for a normal operator, the controversial rating factor is eliminated and the total T.M.U.'s gives the time required for the job in question. The conventional allowances for personal fatigue and unavoidable delays are then added to determine the allowed time for the job.

Incidentally the only tools required are the Data Card and a tape rule. Naturally you can take stop watch readings, if you wish, to check your calculated results.

What Will They Do?

FIRST: The information obtained from these analytical studies may be used as the *basis for developing better methods.* This may be handled as:

1. Better methods in advance of beginning production — more about this later on.
2. Improve existing methods.
3. Guiding product design.
4. Developing effective tool design.
5. Selecting effective equipment.

SECONDLY: The data can be used to establish production or Wage Incentive standards.

1. Establish time standards.
2. Developing time formulae or standard data.
3. Estimating (the procedure permits estimating with accuracy not possible heretofore).

THIRDLY: A few miscellaneous uses.

1. Training supervisors to become highly methods conscious as M.T.M. creates a new awareness as to how people work. A person may have looked at an operation countless times but when he has become skilled in Methods Time Measurement he will see new motions he never before observed.
2. Settling grievances in connection with production standards. This usually evolves about the simple question: "Is the operator following the prescribed method or not?"
3. Research — particularly in connection with methods, learning time, performance rating and the most recent in this field operator training in a fraction of the time previously required.

How Are They Handled?

The simplest way to explain this and to show how some of the advantages, just mentioned actually work out, will be to simulate an operation.

This operation is a very simple one — simply placing a small plastic cap on a plastic nozzle.

Back in December 1949 while a representative of Methods Engineering Council was conducting an M.T.M. class at a plastic manufacturing plant in the States they received an inquiry for a large volume of these nozzles and caps. The actual preparation of the material up to the point of assembly was standard procedure for them but they had no data for this assembling operation to complete their product cost. The usual thing occurred and a meeting of all interested department heads was held during which they agreed that 2,000 pieces an hour would probably be maximum and they submitted their estimated cost accordingly. The conference leader heard of this and securing a few sample assemblies decided to have the M.T.M. group work on it as a practice job. Method No. 1 shows the way it had been proposed to perform the job. Two hopper type containers of caps and nozzles were placed on the work bench at the operator's right and left hands and a drop delivery chute was located below the area where the assembly would be performed. The departmental service man would look after supplies to and from the operator.

The analysis of the operation would then be as shown as Method No. 1. This showed that the estimated production of 2,000 was not to be obtained by this method, at least not by an average operator, so the M.T.M. group proceeded to improve the method. (See Exhibit I, p. 225).

Both parts being small it seemed advisable to grasp a handful of each, instead of one at a time, thus reducing the number of reach and move elements required. The parts could be easily palmed so that several could be assembled one after the other. This was tried successfully and the Methods Analysis is that shown for Method No. 2.

This idea was carried a step further, when a double handful of nozzles were picked up and dumped on the work bench, they were then placed upright and then a number of caps were secured in each hand and just placed on the nozzle. When caps had been placed on all the nozzles a flat piece of wood was picked up and used to press six or seven caps in place at one time. In connection with these plastic nozzles and caps on tins of oil, lighter fluid and others of this type, it should be explained that there is no thread on the nozzle and the cap is simply pressed on and stays put. (See Exhibit II, p. 226).

This Method No. 3 introduced a completely different method analysis consisting of six elements against the original single element yet the production per hour under this set-up rose to 3,333. A considerable increase over the original estimate. (See Exhibit III, p. 227; Exhibit IV, p. 228).

Still not satisfied, the group continued searching for other improvements, someone suggested that some means should be available to feed the nozzles to the operator, who would then have only the cap to handle. There had been a variation to the board closing method con-

sidered under Method No. 3 where the board was mounted on a kick press; due to the extra handling involved when the 20 nozzles were lined up by hand, this method was placed to one side for later consideration and was reconsidered for Method No. 4.

The machine closest to the one they had in mind was a dial and chute feed mechanism used for rivetting and their purchasing department were requested to try and locate a supplier who could furnish a machine of this type large enough to handle the nozzles. This of course involved a capital expenditure so possible savings had to be determined to justify this expense. The quotation this company had submitted had by this time been accepted and an order of considerable size had been received hence the possibility of spending money for additional equipment was greatly enhanced. (See Exhibit V, page 229).

Method No. 4 was developed as shown using the proposed mechanical set-up review analysis sheet and production per hour was determined to be 4,348. You will note that *all the development of this operation* had been done *before the actual operation was performed* in the plant and the *time required* to perform it under *each* of the *four methods established without a stop watch timestudy* — something which could not have been done under conventional Time Study and Methods Study.

To complete the story the desired equipment was located and purchased and the standard developed under Method No. 4 was made effective. To satisfy himself this conference leader kept in contact with this Industrial Engineering group and found that in actual production the operator was earning on the average, a bonus of 25% to 30%.

This example in itself answers my earlier questions on Predetermined Time Standards — "How are they handled?" and "Are they any good?" You have seen how easily the data is used and the end result of a 25% to 30% bonus is what is normally expected from conventional Time Study standards. There are countless other operations which could have been used, but this one impressed me by showing the scope for improvements found in such a simple assembly job.

Within Johns-Manville the application of M.T.M. is limited, as so many of our operations are machine controlled, however, where applicable M.T.M. is most certainly used.

In conclusion I would like to stress the fact that a Timestudy Engineer, Industrial Engineer, Cost Accountant, Manager or Student who undertakes a study of M.T.M., B.M.T. or Work Factor will become methods conscious with a completely new and forceful awarness. However, a word of warning — you cannot obtain a working knowledge of these systems by reading a book about them. In training new Time Study Engineers I most sincerely recommend that they be trained first in one of these predetermined time systems and then trained in conventional stop watch time study. They will do a very much better job and your company will reap benefits not evident before.

EXHIBIT I

METHODS ANALYSIS CHART

Part: Plastic Nozzles and Caps — Sheet No. 1 of 1

Operation: Assemble—Method No. 1 — Formula

Application: — Date: 12-5-49

Description	No.	L.H.	TMU	R.H.	No.	Description
Reach to cap		R4C	8.4	R4C		Reach to nozzle
		T45*		T45*		
Grasp cap		G4C	12.9			Grasp nozzle
			9.1	G4B		
Move to assemble		M4C	7.3	M4C		Move to assemble
		T30S*		T30S*		
Preposition cap		G2*		G2*		Preposition nozzle
Place cap on nozzle		P1SE	5.6			
Press cap on nozzle		AP2	10.6	AP2		Press cap on nozzle
Release assembly		RL1	1.7	RL1		Release assembly
			55.6			

Element Description	Element Time—TMU	Conversion Factor .00001	Leveled Time	% Allowance	Element Time Allowed	Occurrences Per Piece Or Cycle	Total Time Allowed
Assemble Method No. 1	55.6	.00056		15	.00064	1	.00064

Total .00064

Pcs. Per Hr.: 1563

* In practice a diagonal stroke is made through the motion symbol to signify a motion performed in combination with another motion and performed by the same body member. The time to perform these two motions are compared and the larger time used, the lesser motion is recorded but "limited out" by the stroke. In the motion analyses the "limited out motion" is generally shown directly below the allowed motion. A demonstration of this can be made by reaching out your right hand a distance of approximately 10", as you do this turn your hand 90° preparatory to picking up an object. In M.T.M. terms you perform an R10B motion combined with a T90°; the data card gives 11.5 and 5.4 T.M.U.'s respectively. The 90° turn of the hand does not require additional time over the reach so this time is limited out.

EXHIBIT II

METHODS ANALYSIS CHART

Part: Plastic Nozzles and Caps — Sheet No. 1 of 1

Operation: Assemble—Method No. 2 — Formula

Application: — Date: 12-5-49

Description	No.	L.H.	TMU	R.H.	No.	Description
Reach to box of caps		R4B T45*	7.1	R4B T45*		Reach to box of nozzles
Grasp several caps (6-8)		G1A	1.7	G1A		Grasp several nozzles (6-8)
Secure caps in hand Move from box	2	G2 M2B* T45S*	11.2	G2 M2B* T45S*	2	Secure nozzles in hand Move from box
			20.0			
Preposition cap in fingers	2	G2	11.2	G2	2	Preposition nozzle in fingers
Move to assemble		M2C	4.2	M2C		Move to assemble
Position cap on nozzle		P1SE	5.6			
Press cap on nozzle		AP2	10.6	AP2		Press cap on nozzle
Release assembly		RL1	1.7	RL1		Release assembly
			33.3			

Element Description	Element Time—TMU	Conversion Factor .00001 Leveled Time	% Allowance	Element Time Allowed	Occurrences Per Piece Or Cycle	Total Time Allowed
Method No. 2						
Get several caps and						
Nozzles	20.0	.00020	15	.00023	1/6	.00004
Assemble cap and nozzles	33.3	.00033	15	.00038	1	.00038
					Total	.00042

Pcs. Per Hr. 2381

*IBID

EXHIBIT III

METHODS ANALYSIS CHART

Part: Plastic Nozzles and Caps — Sheet No. 1 of 2

Operation: Assemble—Method No. 3 — Formula

Application: — Date: 12-5-49

Description	No.	L.H.	TMU	R.H.	No.	Description
Move 20 Nozzles From Box to Table						
Reach to box of nozzles		R14B	14.4	R14B		Reach to box of nozzles
Contact nozzles		G5	0	G5		Contact nozzles
Move hands together		M4B	6.9	M4B		Move hands together
Grasp nozzles		G1A	1.7	G1A		Grasp nozzles
Move nozzles to table		M12B	13.4	M12B		Move nozzles to table
Release nozzles		RL1	1.7	RL1		Release nozzles
			38.1			
Stand Nozzles Upright on Table						
Reach to nozzle		R2B	4.3	R2B		Reach to nozzle
Contact nozzle		G5	0	G5		Contact nozzle
Move nozzle upright		M1B	1.7	M1B		Move nozzle upright
Release nozzle		RL2	0	RL2		Release nozzle
			6.0			
Get Caps From Box (10 Per Hand)						
Reach to caps		R4B T45*	7.1	R4B T45*		Reach to caps
Grasp several caps		G1A	1.7	G1A		Grasp several caps
Secure caps in hand	2	G2	11.2	G2	2	Secure caps in hand
Move from box		M2B* T45S*		M2B* T45S*		Move from box
			20.0			

Element Description	Element Time—TMU	Conversion Factor .00001 / Leveled Time	% Allowance	Element Time Allowed	Occurrences Per Piece Or Cycle	Total Time Allowed
Method No. 3						
Move nozzles from box						
to table	38.1	.00038	15	.00044	1/20	.00002
Stand nozzles upright	6.0	.00006	15	.00007	1/2	.00004
Get caps from box	20.0	.00020	15	.00023	1/20	.00001

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EXHIBIT IV

METHODS ANALYSIS CHART

Part: Plastic Nozzles and Caps — Sheet No. 2 of 2

Operation: Assemble—Method No. 3 Cont. — Formula

Application: — Date:

Description	No.	L.H.	TMU	R.H.	No.	Description
Assemble Two Caps to Nozzles						
Preposition cap in fingers	2	G2	11.2	RL1**		
Move to assemble		M2C	4.2	G2**		Preposition cap in fingers
Position cap on nozzle		P1SE	5.6			
Release cap		RL1**				
			4.2	M2C		Move to assemble
			5.6	P1SE		Position cap on nozzle
			30.8			
Press Assembled Parts With Board						
Reach for board		R12B	12.9			
Grasp board		G1A	1.7			
Move board to R.H.		M9A	10.5	R7A**		Reach for board
				G1A**		Grasp board
Move board to ass'ys.		M6B	8.9	M6B		Move board to ass'ys.
Release board		RL1	1.7	RL1		Release board
Reach to center of board		R4B	7.1	R4B		Reach to center of board
Press board on assemblies	3	AP2	31.8	AP2	3	Press board on assemblies
Release board		RL2	0	RL2		Release board
Reach for board		R4B	7.1			
Grasp board		G1A	1.7			
Move board aside		M12B	13.4			
Release board		RL1	1.7			
			98.5			
Move Assembled Parts Aside						
			34.5	R10B	3	Reach to finished parts
			0	G5	3	Contact
			36.6	M10B	3	Move parts to drop delivery
			0	RL2	3	Release
			71.1			

Element Description	Element Time—TMU	Conversion Factor .00001 / Leveled Time	% Allowance	Element Time Allowed	Occurrences Per Piece Or Cycle	Total Time Allowed
Assemble caps to nozzles	30.8	.00031	15	.00036	1/2	.00018
Press assembled parts with board	98.5	.00099	15	.00115	1/40	.00003
Move assembled parts aside	71.1	.00071	15	.00082	1/40	.00002
					Total	.00030

Pcs. Per Hr.: 3333

EXHIBIT V

METHODS ANALYSIS CHART

Part: Plastic Nozzles and Caps — Sheet No. 1 of 1

Operation: Assemble—Method No. 4 — Formula

Application: — Date: 12-5-51

Description	No.	L.H.	TMU	R.H.	No.	Description
Get Caps From Box or Hopper						
Reach to caps		R4B T45	7.1	R4B T45		Reach to caps
Grasp caps		G1A	1.7	G1A		Grasp caps
Secure caps in hand	2	G2	11.2	G2	2	Secure caps in hand
Move from hopper		M2B* T45S*		M2B* T45S*		Move from hopper
			20.0			
Assemble Two Caps to Nozzles						
Preposition cap in fingers	2	G2	11.2	RL1		Release
Move to assemble		M2C	4.2	G2	2	Preposition
Position cap on nozzle		P1SE	5.6			
Release cap		RL1	4.2	M2C		Move to position
			5.6	P1SE		Position
			30.8			
Press Caps with Foot Operated Block (Every 6 pcs.)						
			19.1	FMP		Press pedal operating block
				FM*		Raise pedal
			19.1			

Element Description	Element Time—TMU	Conversion Factor .00001 Leveled Time	% Allowance	Element Time Allowed	Occurrences Per Piece Or Cycle	Total Time Allowed
Get caps from box	20.0	.00020	15	.00023	1/20	.00001
Assemble caps and nozzles	30.8	.00031	15	.00036	1/2	.00018
Press caps and nozzles	19.1	.00019	15	.00022	1/6	.00004
					Total	.00023

Pcs. Per Hr.: 4348

*IBID

** In practice, a symbol is circled to denote "motions performed simultaneously by two different body members" with the lesser valued motion being limited out. A demonstration of this would be to place both hands on the desk in front of you palms up, turning both hands at the same time and towards each other, turn one hand palm down (T180°) and the other hand on edge or into a vertical position resting along the little finger and side of hand (T90°). The MTM data assigns a value of 9.4 and 5.4 T.M.U.'s to these motions so that the T90° would be circled and limited out by the larger motion (T180°).

Student Section . . .

Comments by A. V. HARRIS, C.A., R.I.A.

FUNDAMENTALS OF COST ACCOUNTING — 1952 EXAMINATION

QUESTION 6 (25 marks)

Ajax Worsteds Ltd. manufacture worsted yarns from wool tops and production cost records are maintained for each of the different qualities and weights (sizes). The yarn passes through three departments — combing, drawing and spinning. In each of these there is some loss in quantity owing to waste and moisture loss.

The following information is given relative to production for the month of June:

Combing Department

20,000 pounds were put into production
12,000 pounds were completely processed and transferred to drawing
2,000 pounds were completed but not transferred
5,000 pounds were in process. All the material and one half the labour and expenses had been applied. The balance of the quantity was lost.

Departmental Costs—Material		$35,000.00
	Labour	37,500.00
	Mfg. Exp.	8,550.00

Drawing Department

9,000 pounds were completed and transferred
2,500 pounds were in process. Three-fifths of the labour and expenses had been applied.

Departmental Costs—Labour		$14,000.00
	Expenses	3,500.00

Spinning Department

7,500 pounds were completed and packed for stock
1,000 pounds were in process with half the labour and expenses applied.

Departmental Costs—Labour		$ 4,500.00
	Mfg. Exp.	2,500.00

REQUIRED

(1) Cost Production Report for each department showing unit costs by elements, by department, cumulative costs and loss unit costs.

(2) Supplementary statement showing quantities put into process, completed and transferred, completed and on hand, and the work in process.

(3) Statement of Work in Process inventory in analyzed form for each department.

(4) Journal entries to record cost of production in each department and the transfers from department to department.

SOLUTION TO QUESTION 6

AJAX WORSTEDS LIMITED
COST PRODUCTION REPORT FOR THE MONTH OF JUNE

	COMBING DEPT. Cost	COMBING DEPT. Per Unit	DRAWING DEPT. Cost	DRAWING DEPT. Per Unit	SPINNING DEPT. Cost	SPINNING DEPT. Per Unit
1. Costs in Department						
Material	$35,000.00	$ 1.84				
Labour	37,500.00	2.27	$14,000.00	$ 1.33	$ 4,500.00	$ .56
Man. Expense	8,550.00	.52	3,500.00	.33	2,500.00	.31
	$81,050.00	$ 4.63	$17,500.00	$ 1.66	$ 7,000.00	$ .87
Cost previous dept. transferred			55,615.00		58,550.00	
			$73,115.00		$65,550.00	
Cost to next dept.	$55,615.00		$58,550.00*		$58,245.00*	
Cost of Product Finished	9,260.00					
Cost of Unfinished Product	16,175.00		14,565.00		7,305.00	
	$81,050.00		$73,115.00		$65,550.00	
Lost Unit Cost				$ .20		$ .38
Cumulative Unit Cost		$ 4.63		$ 6.49		$ 7.74
*Adjusted to provide for fractions.						
2. Quantity Production Report						
Put in Process	20,000 lbs.					
From Previous Dept.			12,000 lbs.		9,000 lbs.	
Total, to be accounted for	20,000 lbs.		12,000 lbs.		9,000 lbs.	
Accounted for as follows:						
Completed and trans. to next dept.	12,000 lbs.		9,000 lbs.			
Completed and trans. to stores					7,500 lbs.	
Completed and on hand	2,000 lbs.					
Work in Process — end of month	5,000 lbs.		2,500 lbs.		1,000 lbs.	
Loss in Production	1,000 lbs.		500 lbs.		500 lbs.	
	20,000 lbs.		12,000 lbs.		9,000 lbs.	
3. Inventories of Work in Process						
Previous Dept. Cost			$12,075.06		$ 6,870.00	
Material	$ 9,200.00					
Labour	5,675.00		1,995.00		280.00	
Overhead	1,300.00		495.00		155.00	
	$16,175.00		$14,565.00		$ 7,305.00	

SOLUTION TO QUESTION 6 (Continued)

Journal Entries

	Debit	*Credit*
Work-in-Process—Combing Dept.	$81,050.00	
Stores		$35,000.00
Payroll		37,500.00
Mfg. Exp.		8,550.00
Work-in-Process—Drawing Dept.	$73,115.00	
Work-in-Process—Combing Dept.		$55,615.00
Payroll		14,000.00
Mfg. Exp.		3,500.00
Work-in-Process—Spinning Dept.	$65,550.00	
Work-in-Process—Drawing Dept.		$58,550.00
Payroll		4,500.00
Mfg. Exp.		2,500.00
Finished Goods	$58,245.00	
Work-in-Process—Spinning Dept.		$58,245.00

COMMENTS

This problem did not give candidates much difficulty. Results were good, and the principal error, where one was made, was in valuing improperly work in process, or in neglecting the increment of cost applicable to lost units.

ADVANCED COST ACCOUNTING — PAPER No. 1, 1952 EXAMINATION

QUESTION 4 (6 marks)

(a) It has been suggested that there are many savings to be had through the use of a system of standard costs. List the savings you believe possible.

(b) Some firms prefer to produce at a steady rate throughout a year whereas others produce at a rate to meet sales peaks. What factors should be considered by management in making the decision as to which policy should be followed?

SOLUTION TO QUESTION 4

(a) It is suggested that students refer to the cost accounting texts, where these are listed completely.

(b) Factors to be considered by management:

1. Source of raw materials — can you buy in quantity or must you accept steady quantity?
2. Storage capacity for raw materials — can you store sufficient to keep production at high level when needed?
3. Cost of raw material — is it cheaper in larger quantities?
4. Is there danger of raw materials deteriorating or becoming obsolete if purchased in advance?
5. Effect on labour market. Will there be a source of supply of labour if you lay off in slack periods and hire in peak periods?
6. Is the operation such that untrained people can handle or must new people be trained at some length?
7. What will be the attitude of labour, particularly a Union?
8. Storage capacity for Finished Goods — can you handle peak inventories?
9. Danger of deterioration and obsolescence of finished product.
10. What is capacity of plant? Can you produce sufficient to meet peaks of sales or must you produce more evenly?
11. Finance — Can you finance purchase of materials, labour, etc., in advance — or are borrowing facilities available?
12. Each possibility should be accurately costed. Which is cheaper?

COMMENTS

The first part of this question was reasonably well answered, but the second, a good practical question in the examiner's opinion, was not well answered. It is surprising that with the many students in commercial business, there was not a better response to the second part of the question. Average marks for the problem were less than 50%.